

Original Research

# Application of Moxibustion Method with Acupressure and Essential Oil Aromatherapy on Pain Reduction and Cervical Dilation During the First Stage of Labour



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Article Info	Abstract
Article history: Received: 27 August 2024 Accepted: 24 October 2024	<p><i>Introduction:</i> Discomfort, fear, and pain are major challenges for pregnant women during childbirth, potentially impeding the progress of labour. Many women opt for non-pharmacological methods, such as moxibustion, acupressure, and essential oil aromatherapy, to avoid medical induction due to their simplicity, accessibility, and cost-effectiveness. This study aims to evaluate the effectiveness of these combined methods in reducing pain and accelerating cervical dilation during childbirth.</p> <p><i>Methods:</i> This study employed a quantitative research design with a two-group pre-post test approach. The sample comprised 30 parturient women in the first stage of labour at the Independent Midwifery Practice within the Denpasar Health Centre's service area, divided into intervention and control groups. Data analysis was conducted to evaluate differences in pain management between the two groups using the Wilcoxon test, while the effectiveness of cervical dilation treatment in both groups was assessed using the Mann-Whitney test.</p> <p><i>Results:</i> The findings indicated a significant difference in pain levels (<math>0.000 &lt; 0.05</math>) following the application of the moxibustion method with acupressure and essential oil aromatherapy. However, there was no significant difference in cervical dilation between the control and intervention groups post-treatment (<math>0.902 &gt; 0.05</math>).</p> <p><i>Conclusion:</i> The moxibustion method, combined with acupressure and essential oil aromatherapy, did not show a significant difference in cervical dilation between the control and intervention groups. This study has several limitations, including a relatively small sample size and a short observation period.</p>
Keywords: acupressure, aromatherapy, moxibustion, oils, pain management, parturition	

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## INTRODUCTION

Childbirth is one of the most significant experiences in a woman's life, with many women desiring a safe, comfortable, and natural birthing process. If left untreated, the discomfort experienced during labour can lead to bodily tension, particularly in the uterus, which may inhibit the delivery process, intensify pain, and prolong labour. Discomfort, fear, and pain are common challenges for birthing women, and they represent some of the greatest obstacles to childbirth progression, potentially impacting its success if not addressed [1].

The first stage of labour, or Phase I, begins with uterine contractions and continues until the cervix has fully dilated (10 cm). The duration of labour in the active phase of this stage should ideally not exceed 10 hours. During this period, contractions intensify, leading the mother to experience increasing levels of labour pain. In Indonesia, pregnant women report experiencing severe labour pain in approximately 85-90% of cases, while 7-15% report little to no labour pain [2].

When the progress of labour is inadequate, prompt assessment is necessary. Extended labour often indicates a prolonged Phase I, with an elongated latent phase during which the uterus remains in a hypertonic state. This may result in ineffective contractions. If contractions that initially appear strong then suddenly weaken, cervical dilation may slow, causing contractions to become less frequent and weaker. In certain cases, prolonged labour can be attributed to increased maternal anxiety, fear, and stress. Such psychological factors elevate stress-

related hormone levels (e.g.,  $\beta$ -endorphins, adrenocorticotropins, cortisol, and epinephrine), which influence uterine smooth muscle, causing muscle tension and reduced blood flow. This reduction in blood flow limits oxygen delivery to the uterus, heightening labour pain and raising the risk of obstetric complications. Prolonged labour can also create mental distress for the mother, which often leads some women to opt for caesarean section delivery. Research has shown that labour pain and duration are frequent reasons for choosing a caesarean delivery [3][4].

Prolonged labour increases the risk of haemorrhage, one of the leading causes of maternal illness and mortality (maternal mortality ratio, or MMR) in Indonesia. According to the 2012 Indonesia Demographic and Health Survey (SDKI), Indonesia's MMR was notably high, at 305 per 100,000 live births, well above the MDG target of 102 per 100,000 live births for 2015 [5]. The 2015 Inter-Census Population Survey (SUPAS) revealed that Indonesia's MMR was three times higher than the MDG target. Common causes of MMR included haemorrhage (1,280 cases), pregnancy-induced hypertension (1,166 cases), and infections (207 cases) [5]. Healthcare services offer numerous options to avoid medical induction, prompting many women to explore alternative or non-pharmacological methods to manage labour pain and facilitate the delivery process, allowing them to maintain the ability to deliver spontaneously. Non-pharmacological methods, such as moxibustion, acupressure, and essential oil aromatherapy, are valued for their ease of

application, affordability, and lower risks to maternal and foetal health [6].

Moxibustion, a traditional Chinese medicinal technique, involves the burning of Artemisia leaves near specific acupuncture points. The heat generated from burning moxa (the Artemisia herb) penetrates the skin, connective tissue, and muscle at targeted acupuncture points, stimulating associated meridians. Moxibustion is believed to offer therapeutic effects by regulating the immune system, stimulating anti-inflammatory responses, enhancing blood circulation, and releasing chemicals that help alleviate pain [7][8]. Certain acupuncture points are commonly used to reduce labour pain and promote cervical dilation, including L14 (Hegu), SP6 (Sanyinjiao), BL31 (Shang Liao), and BL32 (Ciliao) [3][9][10][11] [12].

The acupressure point L14 is located between the first and second metacarpal bones, midway between the radial side of the metacarpal bone and the lateral side of the hand. The SP6 point lies on the inner lower leg above the medial malleolus. Applying moxibustion at the L14 and SP6 points is believed to help reduce pain and promote cervical maturation. Points BL31 (Shang Liao) and BL32 (Ciliao), situated on the first and second sacral vertebrae, are primary points for relieving lower back pain and aiding cervical dilation by providing a strong sensation of qi in the lower back or cervical area. Applying moxibustion to points BL31-32 can help block pain signals to the spinal cord and brain, while firm pressure during application may stimulate endorphin release at spinal synapses and in the brain, reducing pain perception [9]; [13]; [14]; [15]; [16].

Aromatherapy uses essential oils or fragrances to promote healing [17]. Jasmine oil is a primary component in aromatherapy and is widely used for its soothing effects on the nervous system [18]. Jasmine aromatherapy can aid the childbirth process by relaxing the mother's nervous system, which can reduce stress and anxiety that otherwise disrupt uterine contractions. The aroma of jasmine essential oil has been shown to stimulate endorphin release, which promotes more effective contractions and potentially increases the production of labour-supporting hormones [19].

Oxytocin, a key hormone in childbirth, induces uterine contractions, and jasmine aromatherapy has been suggested to enhance oxytocin release, strengthening contractions and accelerating cervical dilation. This effect is essential as successful labour relies on effective uterine contractions [20]; [21]; [22].

Jasmine aromatherapy can be administered by adding 100 ml of water to a diffuser with 3-5 drops of jasmine oil. Once mixed, the diffuser is activated to release the scent during labour [23]. Essential oils, such as lavender and jasmine, can reinforce contractions and provide analgesic and antispasmodic effects. These properties enhance the mother's coping mechanisms when used independently or combined with complementary therapies [19]. Given this context, the application of moxibustion with acupressure and essential oil aromatherapy to reduce pain and accelerate cervical dilation during the first stage of labour presents a valuable alternative to caesarean section. It also aids in recovery by reducing pain and promoting relaxation after delivery. The

findings contribute to the provision of complementary, evidence-based obstetric and gynaecological care, especially within independent midwifery practices.

## **METHODS**

### ***Design, participant, study setting***

This study was quantitative in nature and employed a quasi-experimental design. Specifically, a two-group pre-post test design was used. The population included all parturient mothers in the first stage of labour who gave birth at the Independent Midwifery Practice within the Denpasar Health Centre's working area. The study sample comprised 30 mothers in the first phase of labour, divided into an intervention group (15 respondents) who received the Moxibustion Method and a control group (15 respondents) who received acupressure and jasmine essential oil aromatherapy. All participants gave birth at the Independent Midwifery Practice within the Denpasar Health Centre's working area. Purposive sampling was used for selection.

Inclusion criteria for participants were gestational age  $\geq 37$  weeks, a single live fetus with cephalic presentation, no labour induction, active phase of labour (cervical dilation  $\geq 4$ -8 cm), adequate contractions (more than three contractions per 10 minutes, each lasting over 40 seconds), and no pregnancy-related comorbidities such as hypertension, diabetes mellitus, or haemorrhage. The exclusion criteria included mothers who declined to participate.

### ***Data Collecting Procedures and Instruments***

Four practitioners collected data for this study, from May to July 2024. The research assistants received training on moxibustion, acupressure techniques, and essential oil aromatherapy application. Moxibustion was applied in the intervention group at the labour acupuncture points SP6, LI4, BL31, and BL32, using a moxa stick held 1 cm from the skin for 10 minutes, repeated during contractions. The control group received acupressure techniques at the same points (SP6, LI4, BL31, and BL32) using finger pressure, along with jasmine essential oil aromatherapy for more than 30 minutes, repeated during contractions per standard operating procedures (SOP). Research instruments included the Visual Analog Scale (VAS) to assess labour pain and a partograph to monitor cervical dilation.

### ***Data analysis***

Data were analysed using SPSS software. Respondent characteristics are presented as a frequency distribution table. A Shapiro-Wilk test was employed to assess data normality. The Wilcoxon test was used to examine differences in treatment effects between the two groups, while the Mann-Whitney test evaluated the effectiveness of dilation treatments in both groups.

### **Ethical considerations**

An ethical review was conducted before initiating the research at the study site. This study adhered to ethical principles, including informed consent, anonymity, and

confidentiality. Ethical approval was granted by the Kartini Bali Health Polytechnic (No: 024/KEPK/DI/PKKB/2024).

## **RESULTS**

**Table 1.**  
Normality Test of Pain Level and Opening Variables

<b>Variable</b>	<b>Pre p Value</b>	<b>Post p value</b>
<b>Pain Level</b>	0,062	0,154
<b>Unveiling</b>	0,004	0,000

**Table 2.**  
Normality Test of Variable Length of Opening

<b>Variable</b>	<b>Statistic</b>	<b>Df</b>	<b>p value</b>
<b>Intervention</b>			
<b>Control</b>	0,887	30	0,004

**Table 3.**  
Pre-test and Post Test Pain Levels Given Moxibustion Method Intervention with Acupressure and Essential Oil Aromatherapy in the Intervention Group and Control Group

<b>Group</b>	<b>n</b>	<b>Mean±Std</b>	<b>P-Value</b>
<b>Control</b>			
Pre-test	15	6,53 ±1,68	
Post-test	15	4.06± 1.79	0,001
<b>Intervention</b>			
Pre-test	15	6.66± 2.12	
Post-test	15	2,60 ± 01,24 6.66± 2.12	0,000

**Table 4**  
Results of Pain Level T-Test in the Intervention Group and Control Group After Being Given the Moxibustion Method with Acupressure and Essential Oil Aromatherapy

<b>Variable</b>	<b>n</b>	<b>Mean±Std</b>	<b>t</b>	<b>P-Value</b>
<b>Pain Level</b>				
Control	15	2,46 ±0,91		
Intervention	15	4.06± 1.38	3,729	0,001
<b>Total</b>	30			

**Table 5.**

Duration of Respondents' Cervical Dilatation in the Control Group and Treatment Group

<b>Group</b>	<b>n</b>	<b>Mean±Std</b>	<b>P-Value</b>
Control	15	<b>4.40±2.13</b>	0,902
Intervention	15	2.53±0.91	

**Data Normality Test**

This study employed the Shapiro-Wilk test (N < 50) to assess data normality, as shown in Table 1. Based on the Shapiro-Wilk test, the p-value for pain level is greater than 0.05, indicating that the pain level data is normally distributed; therefore, parametric analysis was used. In contrast, the p-value for the cervical dilation variable in both pre- and post-tests is below 0.05, indicating a non-normal distribution, and consequently, a non-parametric test was employed.

*The pain level of pre-test and post-test respondents was given the Moxibustion Method intervention with Acupressure and Essential Oil Aromatherapy*

The pre- and post-test pain levels of respondents were measured following intervention with the Moxibustion Method, Acupressure, and Essential Oil Aromatherapy in both the intervention and control groups, as presented in Table 3. In the control group, the mean pre-test pain score was 6.53, and the post-test score was 4.06, with a p-value of 0.001 (p < 0.05), indicating a significant difference between pre- and post-test pain levels. Similarly, the intervention group demonstrated a mean pre-test pain score of 6.66 and a post-test score of 2.60, with a p-value of 0.000 (p < 0.05), indicating a significant reduction in pain levels following

treatment.

*Comparison of Pain Levels Between Control and Intervention Groups Following the Moxibustion Method with Acupressure and Essential Oil Aromatherapy*

A comparative analysis was conducted to examine the relationship between pain levels in the control and intervention groups. The results of the Mann-Whitney test are presented in Table 4. The mean difference in pre- and post-test pain levels was 2.46 in the control group and 4.06 in the intervention group, with a p-value of 0.001 (p < 0.05), indicating a significant difference in pain reduction between the control group (Acupressure and Essential Oil Aromatherapy) and the intervention group (Moxibustion Method).

*Difference in Mean Cervical Dilation Before and After Treatment in Intervention and Control Groups*

The duration of cervical dilation in both the control and intervention groups is shown in Table 5. In the control group, the mean score was 4.40, while in the intervention group, it was 2.53. With a p-value of 0.902, this finding indicates that there is no significant difference in cervical dilation between the control group

(Acupressure and Essential Oil Aromatherapy) and the intervention group (Moxibustion Method).

## DISCUSSIONS

Based on the results of statistical testing, it is evident that there is a significant difference in pain levels between the control and intervention groups following the application of the Moxibustion Method with Acupressure and Essential Oil Aromatherapy. The mechanism behind this pain reduction can be attributed to moxibustion, which stimulates specific acupoints to increase energy flow (qi) and improve energy balance in the body [24]. Previous studies have shown that moxibustion can significantly alleviate pain related to uterine contractions. A systematic review and meta-analysis protocol has been proposed to evaluate the effectiveness of moxibustion specifically for uterine contraction pain, highlighting its potential to improve maternal quality of life and promote postpartum recovery [25]. Moxibustion may modulate pain perception through its effects on the central nervous system, impacting brain regions associated with pain processing [24]; [26].

Acupressure is also effective in reducing pain by stimulating specific points related to pain perception [4]. Research indicates that acupressure can effectively reduce labour pain during the active phase of the first stage of labour, with several studies showing a significant reduction in pain intensity among labouring mothers [27]; [28]. Essential oil aromatherapy, on the other hand, affects the central nervous system by inducing

relaxation, thereby lowering the perception of pain [6]. This holistic approach combines complementary therapeutic modalities that reinforce each other's effects.

Recent research suggests that a combination of moxibustion, acupressure, and essential oil aromatherapy is effective in reducing pain during childbirth. A study involving 120 midwife patients found that this combined treatment significantly reduced pain levels compared to the control group ( $p < 0.05$ ) [12]. Similar findings were reported in a study of 100 post-cesarean patients, where this intervention combination led to a significant reduction in pain compared to the control group ( $p < 0.01$ ) [29]. The effectiveness of this approach is thought to be due to the complementary mechanisms of each modality. Moxibustion may enhance energy balance by stimulating acupoints, while acupressure reduces pain by targeting specific points on the body [4]. Meanwhile, essential oil aromatherapy induces relaxation and reduces pain perception through effects on the central nervous system [6].

Several studies have also explored the impact of moxibustion, acupressure, and essential oil aromatherapy on labour progression. However, findings from this study did not indicate a significant effect. A study on 150 labouring women showed no difference in the duration of the first stage of labour between the group receiving the combination therapy and the control group ( $p > 0.05$ ) [30]. Similar results were found in a study involving 180 patients, where no significant difference in cervical dilation time was observed between the intervention and control groups ( $p = 0.12$ ) [7]. Another study

with 120 participants reported consistent findings, with the combination therapy group not experiencing a significantly faster cervical dilation compared to those receiving standard care alone ( $p = 0.09$ ) [22].

While combination interventions effectively reduce labour pain, they do not appear to influence the progression of labour significantly. This may be due to individual variability, as factors such as fetal size and position, contraction strength, and maternal health condition all affect labour duration. Such variability makes it challenging to establish a consistent impact of external interventions, like moxibustion, acupressure, and essential oil aromatherapy, on labour progression. Therefore, the use of these combined methods should be primarily focused on pain management rather than on accelerating labour.

### **IMPLICATION**

**Theoretical Implications:** This study contributes to maternity nursing by supporting the theory that complementary therapies, including moxibustion, acupressure, and aromatherapy, can effectively reduce labour pain. This finding aligns with literature indicating that stimulation of acupuncture points and the use of essential oils can positively affect the nervous system and the body's energy balance, thus supporting more effective pain management.

**Practical Implications:** To enhance the quality of maternity nursing services, midwives may incorporate moxibustion, acupressure, and essential oil aromatherapy

as part of interventions to reduce pain and improve maternal comfort during the first stage of labour. Although these methods can be applied across various healthcare facilities, it is crucial to use the appropriate therapeutic dosage. Therefore, these interventions should only be administered by experienced practitioners to ensure safety and effectiveness for pregnant women during labour. Limitations of this study include the relatively small sample size and short observation period.

### **LIMITATIONS**

Due to limitations such as the relatively small sample size and short observation period, further research with larger samples and extended observation periods is recommended to verify these findings.

### **CONCLUSION**

There are significant differences in pain levels before and after the application of the Moxibustion Method with Acupressure and Essential Oil Aromatherapy for reducing pain and aiding cervical dilation during childbirth. While these combined interventions effectively reduce labour pain, they are not a determining factor for accelerating the birth process, given the influence of individual factors. The primary use of moxibustion, acupressure, and essential oil aromatherapy should be directed towards labour pain management rather than expediting childbirth.

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